

IN THE CLAIMS:

1. **(Original)** An acoustic sensor comprising:
 - at least one resonant element;
 - a driver comprising an electrical coupling means and an electromagnetic field source, arranged such that, in use, the electrical coupling means transfers current to the electromagnetic field source which produces an electromagnetic field that drives the at least one resonant element to produce acoustic waves directed to a predetermined part of a test sample;
 - an electromagnetic detector arranged to receive, in use, the acoustic spectrum emitted from the test sample after the acoustic waves have interacted with the test sample; and
 - an electrical circuit connected to the driver and electromagnetic detector, the circuit arranged, in use, to provide the current and to detect, in combination with the electromagnetic detector, the acoustic spectrum received by the electromagnetic detector.
2. **(Original)** A sensor according to claim 1, wherein the electronic circuit comprises an electrical oscillator.
3. **(Original)** A sensor according to claim 1, wherein the electronic circuit comprises a frequency modulated signal generator, an AM diode detector and a lock-in amplifier.

4. **(Currently Amended)** A sensor according to ~~any preceding claim~~
1, wherein the electromagnetic field source and the electromagnetic
detector are the same member.
5. **(Currently Amended)** A sensor according to ~~any preceding claim~~
1, wherein the electromagnetic field source is a single wire.
6. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~
claim 4, wherein the electromagnetic field source is a coil.
7. **(Original)** A sensor according to claim 6, wherein the coil is spiral.
8. **(Currently Amended)** A sensor according to ~~claim 6 or claim 7~~,
wherein the coil is copper.
9. **(Currently Amended)** A sensor according to ~~claim 7 or claim 8~~,
wherein the coil is formed from wire wound into a flat spiral
element.
10. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~
claim 4, wherein the electromagnetic field source is a microwave
horn.
11. **(Currently Amended)** A sensor according to ~~any of the preceding~~
claim, claim 10, wherein the electromagnetic detector is a single
wire.
12. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~
claim 10, wherein the electromagnetic detector is a coil.
13. **(Original)** A sensor according to claim 12, wherein the coil is
spiral.

14. **(Currently Amended)** A sensor according to ~~claim 12 or~~ claim 13, wherein the coil is copper.
15. **(Currently Amended)** A sensor according to ~~claim 3 to~~ 14, wherein the coil is formed from wire wound into flat spiral element.
16. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~ claim 10, wherein the electromagnetic detector is a microwave horn.
17. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~ claim 16, wherein the resonant element is metal.
18. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~ claim 17, wherein the resonant element is magnetostrictive.
19. **(Currently Amended)** A sensor according to ~~any of claims 1 to~~ claim 16, wherein the resonant element is piezoelectric.
20. **(Currently Amended)** A sensor according to ~~any preceding claim~~ claim 19, wherein the resonant element is a composite of at least two different materials.
21. **(Currently Amended)** A sensor according to ~~any preceding claim~~ 20, wherein the test sample is in ~~[the]~~ a gaseous phase.
22. **(Original)** A sensor according to claim 21, wherein the resonant element is coated with a polymer layer.
23. **(Currently Amended)** A sensor according to ~~any preceding claim~~ 22, wherein the test sample is in ~~[the]~~ a liquid phase.

24. **(Currently Amended)** A sensor according to ~~any preceding claim~~ 23, wherein the electrical coupling means is a multiply resonant transmission line.
25. **(Currently Amended)** A sensor according to ~~any preceding claim~~ 24, wherein the resonant element is coated with a biorecognition layer.
26. **(Currently Amended)** A sensor according to ~~any one of the preceding claims~~ claim 25, wherein in use, the sensor detects cells.
27. **(Currently Amended)** A sensor according to ~~any of claim 1 to claim 25~~, wherein in use, the sensor detects proteins.
28. **(Currently Amended)** A sensor according to ~~any of claims 1 to claim 25~~, wherein in use, the sensor detects antibodies.
29. **(Currently Amended)** A sensor according to ~~any of claims 1 to claim 25~~, wherein in use, the sensor detects nucleic acids.
30. **(Original)** A method for use in acoustic sensing, the method comprising the steps of:
- applying a current to an electrical coupling means;
 - transferring current from the electrical coupling means to an electromagnetic field source;
 - driving, with an electromagnetic field produced by the electromagnetic field source, at least one resonant element to produce acoustic waves directed to a predetermined part of a test sample; and

detecting with an electronic circuit connected to the electromagnetic field source together with an electromagnetic detector and the electrical coupling means, the acoustic spectrum produced after the acoustic waves have interacted with the test sample.

31. **(Original)** A method according to claim 30, wherein the at least one resonant element produced acoustic waves by electrostriction.
32. **(Original)** A method according to claim 30, wherein the at least one resonant element produces acoustic waves by magnetostriction.
33. **(Currently Amended)** A method according to ~~any of claims 30 to~~ claim 32, wherein the acoustic waves are detected by means of an electrical oscillator tuned to the fundamental or harmonic frequency of the resonant element.
34. **(Currently Amended)** A method according to ~~any of claims 30 to~~ claim 32, wherein the acoustic waves are detected by means of a frequency modulated signal generator, an AM diode detector and a lock-in amplifier.